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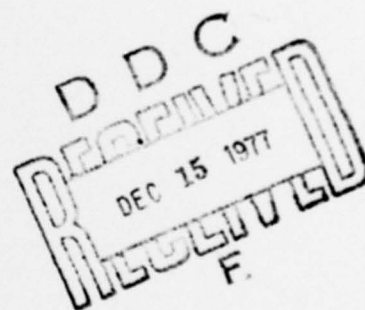
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  This report lists all unclassified technical reports which have been published during the period from July 1976 through September 1977. Reports are listed under the following four NPRDC product areas: Personnel Acquisition, Utilization, and Effectiveness; Human Performance in Navy Systems; Personnel Education and Training; and Personnel/Manpower Management.		

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## SUMMARY

Reports are listed under the following four NPRDC product areas:

1. Personnel Acquisition, Utilization, and Effectiveness--Techniques, procedures, and systems for recruiting, selecting, assigning, advancing, and retaining Navy personnel for optimum initial and career assignment and utilization. Development of measures, tests, and instruments to determine occupational and skill requirements and career advancement paths and to assess aptitudes, attitudes, and motivation.
2. Human Performance in Navy Systems--Techniques and methods for measuring and enhancing human performance in Navy systems under various conditions and the application of those methods to assess personnel proficiency levels and to quantify human capabilities and limitations. Includes consideration of human factors in the design of equipment.
3. Personnel Education and Training--Development of instructional technologies and procedures and their application to human learning principles to develop required skills, knowledges, and abilities in naval personnel. Includes test and evaluation of training concepts, methods, and programs.
4. Personnel/Manpower Management--Models, tests, and techniques for improved manpower forecasting and planning systems and development of management decision aids and processes. Includes measures of organizational and management effectiveness.

Qualified users may request copies of reports from the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314 (Telephone: Commercial (202) 274-7633 or Autovon 284-7633. The DDC Accession Number (AD) should be included for each requested document. Reports listed in this bibliography that have unlimited distribution can also be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22151 (Telephone: Commercial (703) 321-8543 (no autovon)).

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## PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS

An Evaluation of the Factor Structure of the HRM Survey, Forms 9 and 11.  
TR 76TQ-40, July 1976. Jane Sachar. DDC Availability Number AD-A028 090.

Two factor analyses were performed on responses to the HRM Survey, one on the sea and one on the shore survey. Five factors emerged on both surveys, namely (1) Supervisory Leadership, (2) Work Group Processes, (3) Command Climate, (4) Satisfaction with the Navy as an Occupation, and (5) Equal Opportunity. In addition, Drug and Alcohol Usage emerged on the sea survey, and Bureaucratic Practices, the shore survey.

Results indicate that Supervisory Leadership factor is appropriately measured by a dimension. Peer Leadership and Work Group Processes items should be incorporated into one dimension. The Command Climate dimension should be reconstructed. Two indices could be substituted for current ones.

Forms 9 and 11 should be revised using emerging factors as new dimensions. Items loading on these factors should be included within these dimensions.

Effect of Human Relations Training on Racial Attitudes of Marines. TR 76TQ-42, August 1976. William F. Kieckhafer. DDC Availability Number AD-A209 383.

The purpose of this study was to develop tests and methodologies to measure both racial attitudes of Marines and the effect of training at the Marine Corps Human Relations Institute (HRI) on those attitudes. A pilot test of a Social Distance Scale (SDS) and a Situational Attitude Scale (SAS) revealed that two types of racial bias occurred on the SDS: positive/negative racial attitudes and interracial/intraracial bias. In line with the purpose of the HRI training program, it was hypothesized that the training would affect a decrease in both types of bias on both measures of racial attitudes.

Positive and negative intraracial biases on the SDS decreased more for both white and black trainees than for the white control group. Positive and negative interracial biases decreased more than the control group only for white trainees. Consistent with previous research, no significant effect of training occurred on the SAS. However, white trainees who were biased on the SDS were significantly biased in the same way on the SAS.

Differential Perceptions of Organizational Climate Held by Navy Enlisted Women and Men. TR 76TQ-43, August 1976. Kathleen P. Durning and Sandra J. Mumford. DDC Availability Number AD-A209 756.

This study addresses the interaction of sex and pay grade on organizational climate dimensions for nonrated and rated shore personnel. Women have an initial tendency to respond optimistically on the Human Resource Management Survey. However, as they advance to the petty officer levels, women become disproportionately disillusioned on certain dimensions. This



PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS (Continued)

is consistently true in the area of attitudes toward peers. With increases in pay grade, women appear to feel less a part of the work group team, whereas the opposite trend is true for men. This suggests that the harmonious assimilation of women into the Navy is not adequately sustained as their careers advance.

Preservice Drug Usage Among Naval Recruits: A 5-Year Trend Analysis.  
TR 76TQ-45, September 1976. Kent S. Crawford, Patricia J. Thomas, and Edmund D. Thomas. DDC Availability Number AD-A030 598.

A specially designed questionnaire was developed and administered to recruits at San Diego, California. The instrument was given on an annual basis from 1971 to 1975 to over 9000 recruits. Items tapped both pre-service drug involvement and relevant background and demographic characteristics.

Analyses indicated that the percentage of preservice drug users had increased from 42 percent in 1971 to 53 percent in 1975. Marijuana was the most commonly used drug over the 5 years. Significant increases were found in rates of usage of marijuana, amphetamines, and barbiturates between 1971 and 1975. Strong relationships were also found between drug involvement and various demographic factors and, in general, supported the contention that drug users possess other characteristics that predispose them to lower rates of military effectiveness.

Experimental Procedures for the Classification of Naval Personnel. TR 77-3, January 1977. Arthur I. Siegel and Joel P. Wiesen. DDC Availability Number AD-A035 744.

Two concepts--miniature job learning and evaluation and assessment center methodology--were woven into a technique for evaluating and classifying personnel for technically oriented jobs. The concepts are presented and the resultant evaluative methodology described. Trial work indicated acceptable internal psychometric characteristics and considerable acceptability for the methods and approach.

Follow-Up Strategies in a Mail Survey: Effect on Return Rate and Response Bias. TR 77-5, December 1976. Jane Sachar, Sue Stumpf, and William Kieckhaefer. DDC Availability Number AD-A033 489.

The present study was designed (1) to assess the effects of various follow-up techniques on the return rate and response bias of demographic and attitudinal measurements, and (2) to explore the possibility that reaction to extensive follow-ups biases the responses from initially uncooperative selectees.

Approximately 1500 Navy and Marine Corps personnel from San Diego were mailed the DoD Family Housing Preference Survey and were assigned to 10 follow-up groups.



#### PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS (Continued)

The results in this study indicate that some type of follow-up procedure results in greater return rates than no follow-up. Response bias was found in some variables.

Selection Criteria for Recruit Company Commanders: Development and Validation. TR 77-9, December 1976. Wilfredo R. Manese, Melitta F. Skrobiszewski, and Norman M. Abrahams. DDC Availability Number AD-A033 993.

An effort to develop procedures for use in selection of prospective recruit company commanders was undertaken in support of CNTT requirements. An experimental battery of paper-and-pencil tests was developed and evaluated against a variety of measures of company commander effectiveness. Results indicated that an interest inventory was the most accurate predictor of effectiveness and recommendations concerning its use were made.

Factor Regression Analysis: A New Method for Weighting Predictors. TR 77-12, December 1976. Ervin W. Curtis. DDC Availability Number AD-A035 441.

A method was developed that sacrifices some "prediction" in the sample at hand in order to achieve a more reliable and stable predictor composite. The method developed, Factor Regression Analysis (FRA), is based on the first principle component of the predictor intercorrelation matrix with validities in the diagonal cells. FRA yielded very stable predictor composites and weights--the weights themselves varied less from sample to sample than did multiple regression (MR) weights from the same samples. These differences were marked for low sample sizes (e.g.,  $N = 25$ ), regardless of the number of variables in regression. With regard to prediction, FRA composites were substantially more valid in the population than the MR composites based on the same samples. The number of predictors in the subset did not turn out to be very important. FRA weights based on samples of 25 were about as valid as MR weights based on samples of 100. With samples of 200 the two methods yielded roughly equivalent prediction.

Psychobiological Predictors of Success in a Navy Remedial Reading Program. TR 77-13, December 1976. Gregory W. Lewis, Bernard Rimland, and Enoch Callaway. DDC Availability Number AD-A037 339.

Early discharge of enlisted men for unsuitability is a serious and growing problem for the military services. The presently available methods of screening are not adequate. The purpose of this research were to investigate newly developed computer-based methods of recording and analyzing brain waves and to determine their value in screening out failure-prone recruits. Visual evoked potentials were used to derive measures of brain amplitude, asymmetry, variance, and latency. Data were gathered for 73 high-risk recruits who had been assigned to remedial academic training. Correlational and discriminant analysis of the data found that several brain wave measures appeared to be effective in predicting recruit graduation or failure.

PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS (Continued)

Comparative Racial Analysis of Enlisted Advancement Exams: Item Differentiation. TR 77-16, February 1977. David W. Robertson, Marjorie H. Royle, and David J. Morena. DDC Availability Number AD-A035 672.

Enlisted Advancement Exams for Pay Grades 4-7 were analyzed for racial differences in test quality in terms of item differentiation and reliability, including the effects from alternative item selection techniques. Item differentiation levels ( $D$  values and  $r_{it}$  values) were found to be lower for Blacks than for Whites, partly because item-difficulty levels were lower for Blacks. Alternative tests with items of similar difficulty for Blacks and Whites reduced Black-White score differences as well as test quality, while tests with easier or more highly correlated items improved test quality with little change in Black-White score differences. The "best" items selected for their high correlations with an internal criterion were not the same as those selected with an external criterion. Empirical validation of present tests and alternate construction procedures was recommended.

Sonar Operator's Attitudes and Beliefs: Effects on Introduction of New Systems. TR 77-18, February 1977. Macy L. Abrams, John P. Sheposh, Peter A. Cohen, and Leanne E. Young. DDC Availability Number AD-036 480.

The present study assessed the extent to which 41 sonar operators used the various functions and features of new systems properly, their evaluations of various aspects of the system, and the relationship of these evaluations to their performance on the system. Results indicated that: (1) none of the operators successfully performed all of the operations necessary to solve the problem, (2) the higher the level of operators' performance, the more routine their orientation toward the system, and (3) general indices, such as satisfaction with leadership or organization, were not related to performance.

Why Women Enlist: The Navy as an Occupational Choice. TR 77-20, March 1977. Patricia J. Thomas. DDC Availability Number AD-A037 340.

There is a popularly held belief, and some evidence, that the motives for joining and work values of females and males enlisting in the military differ. Using an experimental questionnaire, this study measured the background, motivation, and occupational values of 1,000 recruits of each sex. The results indicated that women and men have different backgrounds but enlist for the same reasons. The sexes differed, however, on two-thirds of the occupational value items. Men were more interested in getting ahead in their jobs and women placed a higher value on a clean, cheerful environment and in helping others.

It was concluded that these feminine values were not consistent with the nontraditional jobs to which they were apt to be assigned.

PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS (Continued)

Vocational Interests and Their Relationships to Academic Major Areas at the U. S. Naval Academy. TR 77-30, April 1977. William A. Sands and Norman M. Abrahams. DDC Availability Number AD-A038 815.

The research objective was the development and evaluation of interest scales designed to provide an index of similarity between a midshipman's interests (as measured by the Strong Vocational Interest Blank) and the interests of Naval Academy graduates in each of three broad academic areas. The validity for each scale was significant in each cross-validation sample. Four alternative strategies for using the interest scales were evaluated and compared.

Screening Male Applicants for Navy Enlistment. TR 77-34, June 1977. William A. Sands. DDC Availability Number AD-A040 534.

The Prediction Of Enlisted Tenure-Two Years (POET-2) model is designed to estimate an enlisted applicant's chances of completing the first two years of service. Applicants with a low probability of survival could be screened out by Navy recruiters in the field resulting in a decrease in premature attrition. The POET-2 model was developed and evaluated on data collected on nonprior service males enlisting in CY 1973 (N = 68,616). Double cross-validation produced validities of  $r_{pb} = .30$  and  $.31$ .

Evaluation and Prediction of Navy Career Counselor Effectiveness. TR 77-35, June 1977. David W. Robertson, Samuel W. Ward, and Marjorie H. Royle. DDC Availability Number AD-A042 032.

Selection procedures were developed to identify senior petty officers who would be most concerned and effective as Navy Career Counselors. Criterion data, collected from multiple counselees per counselor, included ratings of perceived warmth, problem-solving effectiveness, and helpfulness. The best single predictor instrument was the Comrey Personality Scale ( $r = .34$ ), with a specially tailored scoring key; while the best predictor multiple was the locally developed Biographical and Attitudinal Inventory and the Dole Ideal Counselor Adjective Check List ( $r = .41$ ). Most counselors were evaluated favorably, with the 32-34 year age counselors rated highest by the youngest counselees. The counselors' helpfulness was rated highest by the low aptitude (Basic Test Battery) counselees. Although the keys were validated primarily for the selection of career counselors, their potential usefulness was discussed for selection to other occupations also, such as Recruiting, which involves substantial amounts of counseling activities.

Organization Development in the Navy: A Strategy for Addressing Disciplinary Problems. TR 77-38, July 1977. Kent S. Crawford. DDC Availability Number AD-A042 486.

The study involved a comparison in nonjudicial punishment (NJP) rates between ships which had participated in the Human Resource Management (HRM)

## PERSONNEL ACQUISITION, UTILIZATION, AND EFFECTIVENESS (Continued)

Cycle and a group of matched control ships. No evidence was found to suggest that mere participation in HRM activities had a significant impact on NJP rates.



## HUMAN PERFORMANCE IN NAVY SYSTEMS

Work Performance: A New Approach to Expectancy Theory Predictions. TR 76TQ-47, September 1976. Delbert M. Nebeker and Melvyn C. Moy. DDC Availability Number AD-A030 451.

Research was conducted to develop and test a model of performance based upon a reconceptualization of Vroom's (1964) expectancy model. A questionnaire was administered to individuals employed as proof machine operators. The questionnaire was designed to estimate components of the new model such as the probability that the individual will be able to work at particular performance levels, the value of specific work outcomes, and the probability that performance at each of the performance levels will lead to the various work outcomes. Theoretical implications are given as to the conditions under which an expectancy model based upon choice among performance is useful.

Ship Motion Effects in the Human Factors Design of Ships and Shipboard Equipment. TR 77-2, November 1976. Richard A. Newman. DDC Availability Number AD-A031 978.

Ship motion can degrade task performance even when the personnel are not actively seasick, but ship motion is not presently considered in the design of ships and shipboard equipment. This report discusses physical, physiological, and behavioral background of how motion affects personnel, and provides a design guide for human factors personnel and design engineers on design to minimize the effects of ship motion on task performance. The design guide covers the subject areas of Ship Characteristics and Personnel Location, Workplace and Environment, Equipment Characteristics and Design, Task Characteristics and Design, and Personnel Factors. A brief discussion of antimotion-sickness drugs is included, and recommendations for research on ship motion are presented.

Measurement of Job-Performance Capabilities. TR 77-6, December 1976. Edward J. Pickering and Adolph V. Anderson. DDC Availability Number AD-A033 992.

This Center is planning an Advanced Development effort aimed at the development of a comprehensive system for obtaining and reporting Navy job-performance capability information. In preparation for that effort, a review and an analysis were undertaken of performance measurement techniques that might support the proposed system. This report presents the results of that review and analysis and suggests a general approach to meeting the Navy's requirements for incumbent capability information relative to critical tasks. The approach which is suggested is based upon the use of quality control techniques analogous to those utilized in the manufacturing of industrial products.

#### HUMAN PERFORMANCE IN NAVY SYSTEMS (Continued)

Significance of Risk in Navy Tactical Decision Making: An Empirical Investigation. TR 77-8, December 1976. Charles F. Gettys, Melvyn C. Moy, and Michael W. O'Bar. DDC Availability Number AD-A033 583.

Research was conducted to determine the extent to which factors of risk are important in the use of operational decision aids. An empirical comparison was made between the performance of individuals using a decision aiding display developed by Decisions and Designs, Inc. (DDI), and the performance of these same individuals using a display developed by the Navy Personnel Research and Development Center. The DDI display was primarily designed to convey information about subjective expected utility (SEU) and does not explicitly present information about the "risk" associated with each of the alternative acts the decision maker might select. The display contrived by NAVPERSRANDCEN was designed to present information about risk as well as SEU.

Visual Search Times for Navy Tactical Information Displays. TR 77-32, May 1977. James R. Callan, L. E. Curran, and Jeneva L. Lane. DDC Availability Number AD-A040 543.

An experiment was conducted to determine the time and accuracy with which an operator could find target items in each of six preformatted information displays. The displays corresponded to two versions (long and short) of three CRT formats proposed for the Naval Tactical Data System (NTDS). The number of items on the displays ranged from 6 to 40.

Symposium Proceedings: Invitational Conference on Status of Job Performance Aids Technology. TR 77-33, May 1977. Edited by Harold R. Booher. DDC Availability Number: AD-A040 540.

This report includes seven papers assessing the state-of-the-art in job performance aids (JPA) technology presented at an invitational conference on 23-25 February 1977. The papers cover, respectively, perspectives in JPA technology base; selection of formats and media for presenting maintenance information; problems in procuring, producing, and evaluating JPAs; user problems in JPA utilization; new directions for information transfer research; JPA/job-oriented training impact on personnel systems; and analysis and conclusions on status of JPA technology.

Survey of Technical Manual Readability and Comprehensibility. TR 77-37, June 1977. Thomas E. Curran. DDC Availability Number AD-A042 335.

Traces the historical development of readability and comprehensibility assessment. Proposes clarifications in terminology in this field. Examines the application of knowledge in this area to the production of more readable and comprehensible Navy writing. Discusses the particular problems associated with technical writing. Surveys the area of comprehensibility of graphics.

HUMAN PERFORMANCE IN NAVY SYSTEMS (Continued)

The Effects of Feedback and an Implied Standard on Work Performance. TR 77-45, September 1977. Steven L. Dockstader, Delbert M. Nebeker, and E. Chandler Shumate. DDC Availability Number AD-A045 430.

Locke (1968) hypothesized that individuals will spontaneously set performance goals when their feedback is related to a standard of performance. This proposal was tested in an actual work setting by comparing the performance rate of keystroke operators who received feedback and a standard with that of a control group who received feedback alone. Performance comparisons over a 3-month period provided strong statistical support for the hypothesis. The outcome is discussed in terms of goal theory and the use of work standards to improve productivity.



## PERSONNEL EDUCATION AND TRAINING

Experimental Evaluation of PLATO IV Technology: Final Report. TR 76TQ-44, August 1976. Richard E. Hurlock and Dewey A. Slough. DDC Availability Number AD-A029 384.

This project experimentally evaluated the computer-based instruction (CBI) technology of the PLATO IV system. The approach was to conduct a set of eight research studies in different Navy training application areas. Short titles of the studies were: remedial math, oscilloscope simulation, sine ratio, multimeter simulation, learner control, recipe conversion, oscilloscope guidance, and part-task trainer.

The final report summarizes the research design, method, results and findings of each study. Experience, information, and data obtained from the research is then used to evaluate instructional effectiveness, technical features and characteristics, range of training applications, instructional material development methods and effort, and development and delivery costs. Conclusions are drawn and recommendations are made about the use of a PLATO IV type system for CBI.

Low Cost Part-Task Training Using Interactive Computer Graphics for Simulation of Operational Equipment. TR 76TQ-46, September 1976. Alice M. Crawford, Richard E. Hurlock, Robert Padilla, and Anthony Sassano. DDC Availability Number AD-A029 540.

The S-3A copilot INCOS panel appearance and functions were simulated with plasma screen computer graphics and touch panel to develop an interactive computer-based training (CBT) course. Experimental comparisons were made between students who studied a workbook eight hours and who received one hour of practice with an instructor in a high fidelity position trainer (PT). Performance of CBT students before hands-on practice in the PT was equal to that of conventionally trained students at the end of PT practice. This methodology appears to offer an effective and low cost approach to part-task training.

A Personnel Readiness Training Program: Operation of the AN/BQR-20A. TR 77-4, December 1976. Jim D. Winchell, Robert C. Panell, and Edward J. Pickering. DDC Availability Number AD-A033 435.

Performance-oriented tests were used to diagnose deficiencies in job performance among Fleet personnel. Self-instructional training materials, designed for shipboard use, were then individually prescribed to correct identified deficiencies. Testing and training programs were developed for three applications: (1) the submarine Sonar Technician operating the AN/BQR-20, (2) the submarine Missile Technician maintaining the Missile Test and Readiness Equipment, and (3) the Boiler Technician operating and maintaining the 1200 PSI Steam Propulsion Plant. This report describes the AN/BQR-20 application in which Sonar Technician Teams from 12 FBM submarines were given a diagnostic pretest and then retested approximately 5 months later. STs from four submarines were assigned to each of three experimental groups: Control, Feedback, and Feedback + Training Groups.



PERSONNEL EDUCATION AND TRAINING (Continued)

Videodisc Technology Use Through 1986: A DELPHI Study. TR 77-11, December 1976. Rodney R. Daynes. DDC Availability Number AD-A034 857.

A preliminary research effort to investigate the diffusion of videodisc technology in diverse environments over a 10-year period was undertaken to determine disc availability for future Navy training requirements. The DELPHI, a technique for eliciting judgments, was used as the primary research approach. It was concluded that, by 1986, the use of audiovisual formats will have increased and the use of videodisc technology will have reached sufficient levels to warrant immediate instructional systems development procedures of videodisc technology.

Historical Antecedents and Contemporary Trends in Literacy and Readability Research in the Navy. TR 77-15, January 1977. John D. Fletcher, Thomas M. Duffy, and Thomas E. Curran. DDC Availability Number AD-A035 582.

This report is a compendium of three papers presented at the Conference on Reading and Readability Research in the Armed Services held on October 28-30 in Monterey, California. The papers cover, respectively, the history of reading and readability research in the Navy, contemporary literacy research in the Navy, and research dealing with the readability and comprehensibility of written materials used in training or on the job.

A Personnel Readiness Training Program: Maintenance of the Missile Test and Readiness Equipment (MTRE MK 7 MOD 2). TR 77-19, March 1977. Gerald J. Laabs, Robert C. Panell, and Edward J. Pickering. DDC Availability Number AD-A037 546.

Performance-oriented tests were used to diagnose deficiencies in job performance and shipboard self-instructional materials were individually prescribed to correct them. Missile Technicians who maintain the Missile Test and Readiness Equipment on 12 submarines were given a diagnostic pretest and retested approximately 5 months later. They were assigned to three groups: (1) a Control Group given feedback on overall scores, (2) a Feedback Group given an outline of specific weaknesses, and (3) a Feedback + Training Group given an outline and assigned specific remedial training. Diagnostic testing was successful in detecting deficiencies. Neither feedback nor feedback plus training improved job performance. This type of information was not considered essential to the job because of the exceptional reliability of the MTRE.

Computer-Based Training of Recipe Conversion with Lower Aptitude Personnel. TR 77-24, April 1977. Patricia S. Fredericks and Leonard B. Hoover-Rice. DDC Availability Number AD-A038 420.

The study tested the feasibility of computer-based training (CBT) for students with below average academic skills and evaluated a job performance aid used in recipe conversion for the Mess Management Specialist School. There were 20 students in each of 3 groups; two;

#### PERSONNEL EDUCATION AND TRAINING (Continued)

CBT experimental groups and a control group. One CBT group received the job aid and the other, the traditional math as taught in the school but on-line. The control group received classroom training from an instructor using traditional math. The CBT groups required significantly less training time than the control while maintaining high scores on the final test which was criterion-referenced. However, the CBT job aid group performed significantly poorer than the no job aid and classroom groups.

Validation of the Instructional Strategy Diagnostic Profile ISDP: Empirical Studies. TR 77-25, April 1977. M. David Merrill and Norman D. Wood. DDC Availability Number AD-A042 334.

Three experimental studies were conducted in real-world settings in an attempt to validate the Instructional Strategy Diagnostic Profile (ISDP) and the accompanying design prescriptions.

Two different methodologies were used. In method one, existing instructional materials were modified on the basis of a selected prescription that resulted from an ISDP analysis of those materials. Two or more versions of the materials were compared in an experimental comparison. Method two consisted of course intervention in which a weak unit of an existing course was identified and modified via several prescriptions resulting from an ISDP analysis. Test performance, affect, confidence, and time were compared for students using the revised materials and students using the original materials.

Reading Skill and Performance in a Sample of Navy Class "A" Schools. TR 77-28, April 1977. Edward G. Aiken, Thomas M. Duffy, and William A. Nugent. DDC Availability Number AD-A038 535.

This study sought to define the relationships between reading skill, reading requirements, and success in a sample of Navy Class "A" Schools. Results showed wide variation in the dependence of performance on reading skills among the schools as well as the amount and difficulty of the reading they require. Reading skill and general ability were as good or better as predictors of school performance as course selector tests in some schools. A discussion of the advantages and disadvantages of several options for dealing with deficient reading is included.

Reading Retention as a Function of Method for Generating Interspersed Questions. TR 77-29, April 1977. John H. Wolfe. DDC Availability Number AD-A038 536.

An experiment with 356 Navy recruits compared the effects on reading retention of adjunct (interspersed) questions generated by four different procedures: human linguistic processing, the AUTOQUEST computer

#### PERSONNEL EDUCATION AND TRAINING (Continued)

program, and two types of cloze algorithms. Results showed that cloze questions interfered with retention and direct improvement effects from AUTOQUEST were as large as those from human-generated questions. No indirect effects of human or computer questions were observed. Further research is recommended to increase the instructional relevance of AUTOQUEST questions and to test their effectiveness in an on-line situation with feedback.

Instructional Decision Making in the Design of Operator Training: An Eclectic Model. TR 77-31, May 1977. John F. Brock. DDC Availability Number AD-A039 800.

A review of an instructional design process for the F-14 aircrew is given. The process emphasized job-relevant learning objectives, hierarchies of learning, and prescriptions for determining instructional strategies.

A Personnel Readiness Training Program: Operation and Maintenance of the 1200 PSI Steam Propulsion Plant. TR 77-36, June 1977. Gerald J. Laabs, Harold T. Harris, Jr., and Edward J. Pickering. DDC Availability Number AD-A042 033.

Performance-oriented tests were used to diagnose deficiencies in job performance among Fleet personnel. Shipboard self-instructional materials were then individually prescribed to correct identified deficiencies. Testing and training programs were developed for three applications: (1) the submarine Sonar Technician operating the AN/BQR-20A, (2) the submarine Missile Technician maintaining the Missile Test and Readiness Equipment (MTRE MK 7 MOD 2), and (3) the Boiler Technician operating and maintaining the 1200 PSI Steam Propulsion Plant. In the present application, the Boiler Technicians from 12 cruisers and destroyers were given a diagnostic pretest and, with the exception of one crew, were retested 3 to 6 months later. Four ships were assigned to each of three experimental groups: (1) a Control Group in which the participants were given feedback on the pretest in terms of an overall percentage score, (2) a Feedback Group in which the members were given an outline indicating their specific weaknesses, and (3) a Feedback + Training Group in which the members were given the same type of information as the Feedback Group but, in addition, were assigned specific remedial training. Diagnostic testing was successful in detecting deficiencies of Fleet personnel on written items related to the operation and maintenance of the 1200 PSI Steam Propulsion Plant. In the pretest sample, of 305 Boiler Technicians only 17 showed no weaknesses. A very small but statistically significant improvement in performance resulted from providing feedback. However, there was little effect of remedial training because only 21 percent of the Boiler Technicians completed their assigned modules. Secondary analyses suggested that, had the assigned training been completed, it would have improved performance. The nonuse of training seems to be due to the excessive time demands associated with the job and, to some



#### PERSONNEL EDUCATION AND TRAINING (Continued)

degree, the lack of adequate study facilities on board ship: Boiler Technicians who studied ashore completed 42 percent of their assigned training while those who studied on board ship completed only 3 percent.

A Personnel Readiness Training Program: Final Report. TR 77-39, August 1977. Adolph V. Anderson, Gerald J. Laabs, Edward J. Pickering, and Jim D. Winchell. DDC Availability Number AD-A043 371.

Performance-oriented tests were used to diagnose deficiencies in job performance among Fleet personnel. Shipboard self-instructional materials were then individually prescribed to correct identified deficiencies. Testing and training programs were developed for three applications: (1) the submarine Sonar Technician operating the AN/BQR-20A, (2) the submarine Missile Technician maintaining the Missile Test and Readiness Equipment (MTRE MK 7 MOD 2), and (3) the Boiler Technician operating and maintaining the 1200 PSI Steam Propulsion Plant. Results from all three areas of application revealed substantial performance deficiencies.

The Role of Reading in the Navy. TR 77-40, September 1977. Thomas G. Sticht, Lynn C. Fox, Robert N. Hauke, and Diana Welty Zapf. DDC Availability Number AD-A044 228.

This report describes a study of the role of reading in the Navy enlisted environment. The Navy Job Reading Task Interview was administered to 178 personnel (68 students, 32 instructors, and 78 job performers). Results provided information on the nature and extent of reading in the Navy, the reading skills of Navy personnel, and their attitudes regarding the Navy's current job training and reading training programs.

Integrated Job Skills and Reading Skills Training System. TR 77-41, September 1977. Thomas G. Sticht, Lynn C. Fox, Robert N. Hauke, and Diana Welty Zapf. DDC Availability Number AD-A044 227.

An exploratory study was conducted to evaluate the feasibility of determining the reading demands of Navy jobs using a methodology that both identifies the type of reading tasks performed on the job and the level of general reading skill required to perform that set of reading tasks. Next, a survey was made of the Navy's job skills training program, career counseling system, and General Education Development System. Based on the results of these two efforts, a general plan was designed outlining the initial development of a job-related reading training program and its later integration into the Navy's job skills training program.



PERSONNEL EDUCATION AND TRAINING (Continued)

Computer-Based Graphic Simulations for Tactical Communications Training. TR 77-42, September 1977. Alice M. Crawford, Richard E. Hurlock, and Thomas P. Rogo. DDC Availability Number AD-A044 837.

The research investigated the use of two-dimensional simulations of the controls and displays of an antisubmarine warfare jet. The purpose was to examine the use of the simulation methodology for training performance skills. The results showed that students liked the training and felt that it had been effective in helping them master the requisite skills. An evaluation by fleet-experienced operators supported these findings. Features of the computer-based training system were discussed, and recommendations for needed research were made.

Empirical Validation of Selected Instructional Strategy Diagnostic Profile Prescriptions. TR 77-43, September 1977. M. David Merrill, Norman D. Wood, Meryl Baker, John A. Ellis, and Wallace H. Wulfeck, II. DDC Availability Number AD-A045 309.

The Instructional Strategy Diagnostic Skills (ISDP), an instrument for diagnosing defects in instruction and prescribing revisions, is designed to rate instruction on two major dimensions--consistency and adequacy. In this study, three experiments were conducted to test the hypotheses underlying the ISDP's consistency and adequacy prescriptions. Navy enlisted men were assigned to 12 treatment groups--four representing remember level instruction; and eight, use level. Experiment I investigated the effects of manipulating consistency of test items and presentation strategies. Experiments II and III investigated the effect of manipulating adequacy of instructional materials designed to teach students to remember and use information respectively. Results provided strong support for the consistency prescription and for two of the three adequacy prescriptions for use level tasks. However, the two adequacy prescriptions for remember level tasks were not clearly supported. It was concluded that the ISDP is a valid instrument for predicting student performance and for evaluating instructional materials.

## PERSONNEL/MANPOWER MANAGEMENT

Utility Theory in Military Personnel Management. TR 76TQ-38, July 1976.  
John R. Schmid and Richard K. Hovey. DDC Availability Number AD-A035 590.

An important element of personnel policy testing and decision making with computer simulation models is criteria used for evaluating changes. Measures of cost and inventory have been used by BUPERS to manage distribution of personnel filling billet structures. Other measures are needed to achieve an optimum distribution of strength. An effort was undertaken to develop another personnel planning tool--utility model. The model would assess the overall value that the Navy should expect to receive from personnel afforded by a level of manpower expenditure.

Two DELPHI experiments and a Broadcast experiment were conducted to solicit opinion of Navy experts from headquarters as well as the fleet regarding the productivity of the average enlisted man in terms of utility to the Navy as he progresses in years of service in specific pay grade. Pay grade utility "tents" from DELPHI experiments developed. Results showed that in all pay grades maximum utility is reached well before end of career.

Analysis of Fleet and Shore Demands on the Naval Supply Center, San Diego. TR 76TQ-39, July 1976. Thomas A. Blanco. DDC Availability Number AD-A035 589.

In developing a system for allocating manpower resources in the Navy, major emphasis has been placed on design of an input-output model to forecast workload of shore activities based upon size and distribution of fleet. To test feasibility of I/O analysis for operational use, a full-scale model of 11th ND is being developed. Structure of I/O analysis requires data on work output of each shore activity and its destination in fleet and other shore activities. Demands placed by fleet must be disaggregated by ship type, movement, and status.

Major effort underway is collection and organization of data and empirical analysis of fleet-shore workload demand network focusing on 12 major shore activities in 11th ND.

Analysis of demand on NSC San Diego was made in terms of individual customers, proportion of fleet demands to shore demands, feasibility of grouping ships by type, effect of deployment and overhaul on NSC's workload, and stability of demand for ship and shore customers.

Determination of Criteria of Operational Unit Effectiveness in the U.S. Navy. TR 76TQ-41, August 1976. Samuel E. Bowser. DDC Availability Number AD-029 387.

The criteria for evaluating organizational effectiveness are considered within a system framework. A general review of the literature is presented. Operational unit management personnel were interviewed and this interview material was content analyzed. The resulting content categories were cross

#### PERSONNEL/MANPOWER MANAGEMENT (Continued)

compared by unit type, position in the organization, rank of respondent and question answered. The results show military managers to be performance oriented and supportive of objective type criteria for evaluations.

Combat System Maintenance Effectiveness Based on 3M Data. TR 77-1, October 1976.  
Lloyd S. Standlee and Del H. Sass. DDC Availability Number AD-A031 994.

A Combat System Department was implemented aboard selected pilot ships with the goal of improving maintenance effectiveness. Pilot and control ships were compared on the basis of data collected and supplied by the MSO 3M reporting system. The data failed to demonstrate that improved maintenance effectiveness resulted from implementation of the new organizational structure.

Analysis of Demands on the Long Beach Naval Shipyard. TR 77-7, December 1976.  
Murray W. Rowe. DDC Availability Number AD-A033 842.

In developing a system for allocating manpower resources in the Navy, major emphasis has been placed on the design of an input-output model to forecast the workload of shore activities, based upon the size and distribution of the fleet. To determine the feasibility of input-output analysis for operational use, a full-scale model of the 11th Naval District is being developed. The structure of input-output analysis requires data on the work output of each shore activity and its destination in the fleet and other shore activities. In addition, the demands by the fleet must be disaggregated by ship type, movement, and status.

A major effort underway is the collection and organization of data and the empirical analysis of the fleet-shore workload demand network, focusing on 12 major shore activities in the Eleventh Naval District. This report is concerned with the analysis of workload demand on one of these shore activities--the Long Beach Naval Shipyard.

The structure of demands on the Long Beach Naval Shipyard was analyzed by using Naval Shipyard workload data that provided a monthly status report (in terms of man-days expended) on all work being performed on each ship. The data base was used to determine the configuration of total workload and the differences in demand among repair categories and among ship types, as well as changes in demand over time.

Optimization in Military Personnel Management. TR 77-14, January 1977.  
John R. Schmid, Richard K. Hovey, and John P. Mayberry. DDC Availability Number AD-A037 429.

Computer-based optimization methodology discussed was developed for BUPERS for purpose of defining long range management goals for each major Navy personnel skill category. Goals defined in terms of objective optimum force distributed by skill grouping, by length of service, and by pay grade. Objective function minimized in optimization methodology is cost



#### PERSONNEL/MANPOWER MANAGEMENT (Continued)

per utile per man-year. Function evaluation involves the use of five major models: Per Capita Cost Model, Stable Strength Model, Utility Model, Reenlistment Elasticity Model, and Optimization Methodology. Descriptions and examples illustrating models and overall optimization methodology are presented.

Combat System Personnel Training and Management Evaluation: Final Report.  
TR 77-17, February 1977. Lloyd S. Standlee and Del H. Sass. DDC Availability Number AD-B016 696L.

This report summarizes the findings of a series of 15 studies performed concerning the maintenance effectiveness of ships having an experimental combat system organizational structure. Overall, the centralized administration of electronics maintenance assists in, but is not sufficient for, resolution of a problem concerning the electronics readiness of Navy combatant ships.

Analysis of Demands on the Naval Air Rework Facility, North Island.  
TR 77-21, March 1977. Thomas A. Blanco and Murray W. Rowe. DDC Availability Number AD-A037 799.

In developing a system for allocating manpower resources in the Navy, major emphasis has been placed on the design of an input-output model to forecast the workload of shore activities, based on the size and distribution of the fleet. To determine the feasibility of an input-output analysis for operational use, a full-scale model of the 11th Naval District is being developed. The structure of input-output analysis requires data on the work output of each shore activity and its destination in the fleet and other shore activities. In addition, the demands by the fleet must be disaggregated by ship type/aircraft model, movement, and status.

A major effort is underway to collect and organize data and to conduct an empirical analysis of the fleet-shore workload demand network, focusing on 12 major shore activities in the 11th Naval District. This report concerns the analysis of workload demands on one of these shore activities--the Naval Air Rework Facility, North Island.

The structure of demands on the Naval Air Rework Facility, North Island was analyzed by using production load norms, induction and completion schedules, "carry-overs," and actual man-hour expenditures, obtained quarterly for FY75 and FY76 from Fleet Support Conference packages prepared by the Naval Air Systems Command Representative, Pacific (NAVAIRSYSCOMREPAC). The data were used to determine the distribution of total workload and differences in demand among aircraft models, engine models, and repair categories.



PERSONNEL/MANPOWER MANAGEMENT (Continued)

Combat System Program: Personnel Survey. TR 77-22, March 1977. Del H. Sass and Lloyd S. Standlee. DDC Availability Number AD-B017 365L.

Personnel assigned to pilot program ships employed in the combat system program were surveyed to evaluate the impact of the experimental organizational concept upon their opinions, attitudes, and morale. The combat system program did not receive a fair and complete test as two of the primary concepts in the plan--the System Test Officer and and Ship's Electronics Readiness Team--were not fully implemented on most of the pilot ships. Two newly developed billets for the Combat System Department--the Battery Control Officer and the Electronic Warfare Officer--were implemented on all pilot ships but appeared to contribute little to the efficiency of the combat system organization.

Analysis of Demands on Naval Regional Medical Center, San Diego. TR 77-23, April 1977. Mark Chipman. DDC Availability Number AD-A038 419.

Report provides analysis of workload demands of NRMHC. Structure of demand analyzed by using inpatient and outpatient data, Master Loading Plans, and Enlisted Data Verification reports. Data used to determine distribution of total workload, and differences in demand among retired and active duty personnel, dependents of active duty personnel, and dependents of retired and deceased personnel.

Input-Output Analysis in Navy Manpower Planning. TR 77-26, April 1977. Stephen Sorensen and Raymond Willis. DDC Availability Number AD-A038 764.

In large-scale organizations having a variety of outputs or products, many units within organization perform primarily a support function. Changes in outputs or activity levels of individual units cause second and higher order effects throughout the system resulting in a substantial impact on aggregate resource requirements. This report focuses on some of the ways in which organizational and workload structures influence the formulation and data analysis of manpower requirements models. Some of issues involved in using intra-organization input-output models as a way of evaluating these influences are considered.

A Policy Evaluation Model and Prototype Computer-Assisted Policy Evaluation System for Naval Personnel Management. TR 77-27, April 1977. Fred Glover, David Karney, and Darwin Klingman. DDC Availability Number AD-A038 804.

This study develops a prototype Computer-Assisted Policy Evaluation (CAPE) system for solving naval personnel assignment problems. CAPE system utilizes a new mathematical formulation for multiobjective function assignment problems which is capable of evaluating a number of important personnel management problems. The computer program documentation for the CAPE system is included.

PERSONNEL/MANPOWER MANAGEMENT (Continued)

Analysis of Workload Demands on the Naval Air Station, Miramar, California.  
TR 77-44, September 1977. William M. Bokesch and Darren S. Wertz. DDC Availability Number AD-A045 560.

In developing a system for allocating manpower resources in the Navy, major emphasis has been placed on the design of an input-output (I/O) model to forecast the workload of shore activities based upon the size and distribution of the fleet. To determine the feasibility of I/O analysis for operational use, a full-scale model of the 11th Naval District is being developed. The structure of I/O analysis requires data on the work output of each shore activity and its destination in the fleet or other shore activities.

A major effort is underway to collect and organize data for the empirical analysis of the fleet-shore workload demand network, focusing on 10 major shore activities in the 11th Naval District. This report is concerned with the analysis of workload demands on one of these activities--the Naval Air Station, Miramar.

The structure of demands on the three largest departments at NAS Miramar (Air Operations, Aircraft Intermediate Maintenance, and Supply) was analyzed. The differences in demand among aircraft types were determined for each of the three departments.

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December 1976. DDC Availability Number AD-A035 626.

This report lists all unclassified technical reports which have been published during the period from May 1973, when the Navy Personnel Research and Development Center was created, to the end of June 1976. Reports are listed under six major functional areas: Personnel Acquisition and Initial Assignment, Career and Occupational Design, Human Performance in Navy Systems, Personnel Education and Training, Personnel Management, and Factors in Personnel Effectiveness.

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 Human Resources Development Division, U. S. Army Personnel Administration  
     Combat Developments Activity  
 Commander, Armed Forces Vocational Testing Group  
 Defense Race Relations Institute  
 Center for Naval Analyses  
 Library Operations Section, Library of Congress  
 Defense Documentation Center (12)